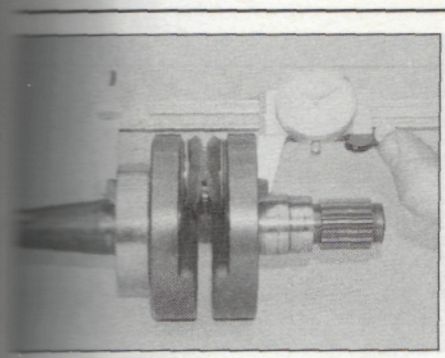


17.11 Measuring the crankshaft axial clearance – Type 122 engines

Warning: This must be done very carefully to avoid the risk of personal injury.

11 Use a Vernier gauge to measure the distance between the inner race of the main bearing and the outer face of the left-hand flywheel **(see illustration)**. *Compare the result* with the table and, if required, fit shims as appropriate – the shims should be installed in the right-hand bearing housing, between the crankcase and the bearing **(see illustration 16.15d)**. Suitable shims are available from an Aprilia dealer.

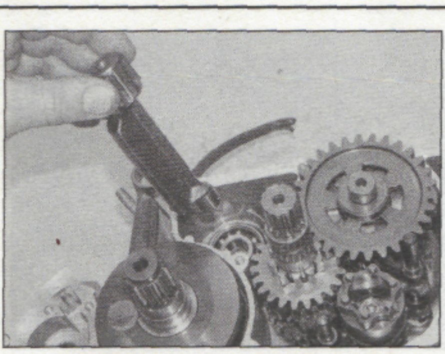
Distance	Shim required
66.72 to 66.92 mm	0.2 mm
66.93 to 67.06 mm	None

Crankshaft axial clearance – Type 123 engines

12 On Type 123 engines, the new main bearings must be in place in the crankcase halves before measuring begins.

13 Place a straight-edge across the inner crankcase sealing surface and use a depth gauge to measure the distance between the sealing surface and the outer race of the main bearing in both crankcase halves. Add the results together, then add the nominal thickness of a compressed crankcase gasket – 0.41 to 0.47 mm.

14 Next, use a Vernier gauge to measure the distance between the outer faces of the left and right-hand flywheels.



18.2 Lift out the balancer shaft

15 Subtract the width of the flywheel assembly from the combined crankcase and gasket width – the result is the axial clearance. Compare the result with the Specification shown at the beginning of this Chapter and, if required, add shims as appropriate to correct the clearance; if fitted, the existing shims may be sufficient to bring the clearance within the specified limit, but if not suitable shims can be obtained from an Aprilia dealer. *The shims should be installed on the right-hand side of the crankshaft only, between the flywheel and the main bearing.*

Reassembly

16 Follow the procedure in Section 16 to install the crankshaft assembly.

18 Balancer shaft

Note: *To access the balancer shaft, the engine must be removed from the frame.*

1 To access the balancer shaft and shaft bearings, follow the procedure in Section 16 and separate the crankcase halves.

2 Lift out the balancer shaft **(see illustration)**.

3 Check the condition of the bearings – they should spin freely and smoothly without any rough spots or excessive noise – and only remove them if they are unserviceable.

4 To remove the right-hand balancer shaft bearing, first refer to the appropriate Sections and remove the crankshaft assembly, selector *drum and forks, gearchange mechanism* (Type 123 engines) and the transmission shafts from the crankcase half.

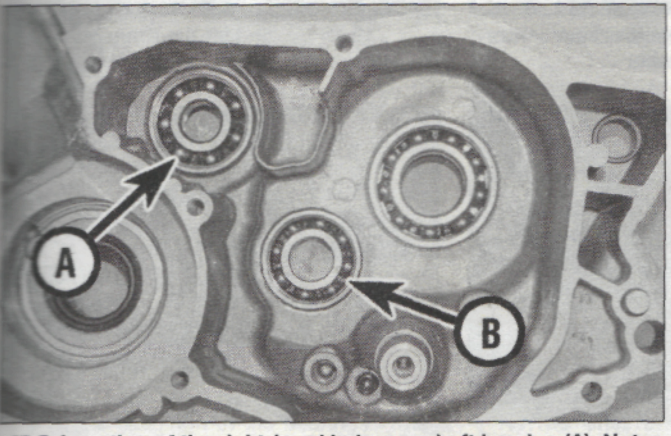
5 The right-hand bearing locates in a blind hole and cannot be driven out **(see illustration)**. A slide-hammer with knife-edged bearing puller attachment is required; pass the expanding end of the puller through the centre of the bearing, then tighten the puller to lock it against the inner back edge of the bearing. Thread the slide-hammer onto the puller, then operate the slide-hammer to jar the bearing out – if necessary, heat the bearing housing with a hot air gun ***(see illustrations 16.15b and 15c)***. Note which way round the bearing is fitted, then install the new bearing, driving it all the way in using a bearing driver or suitable socket.

6 To remove the left-hand balancer shaft bearing, first remove the retaining screw and washer **(see illustration)**. Turn the case over *and heat the bearing housing with a hot air* gun, then tap the bearing out using a bearing driver or suitable socket. Note which way round the bearing is fitted, then install the new bearing, driving it all the way in. Clean the threads of the retaining screw, then apply a suitable non-permanent thread-locking *compound. Install the washer and tighten the* screw securely.

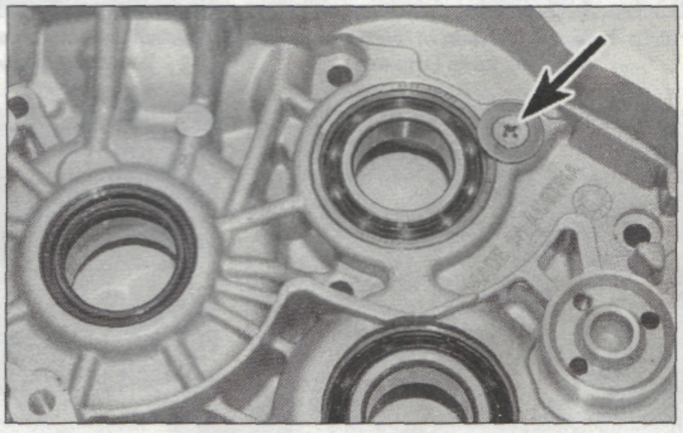
7 Inspect the bearing journals on each end of the balancer shaft – if required, use a micrometer to measure the journals and compare the results with the Specifications at the beginning of this Chapter. If either journal is worn below the service limit, renew the balancer shaft.

8 Inspect the circlip groove on the left-hand end of the shaft for damage. Ensure that the balancer shaft gear is a tight fit on its splines – if a new gear is being fitted and the gear is loose, renew the balancer shaft.

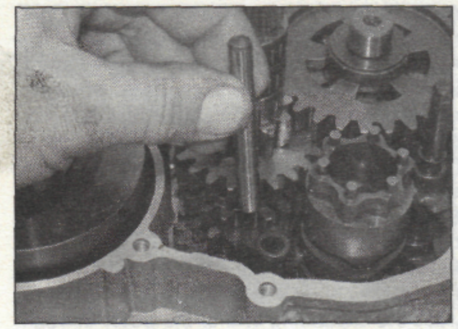
9 Installation is the reverse of removal.

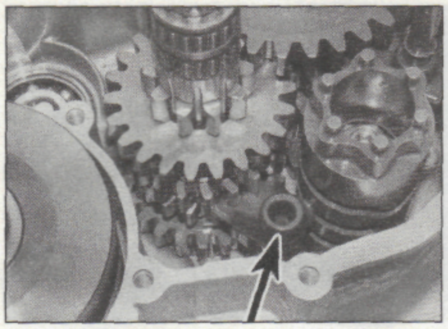


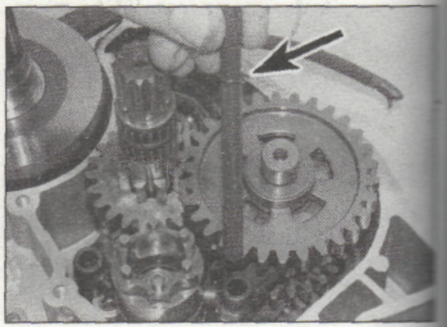
18.5 Location of the right-hand balancer shaft bearing (A). Note the location of the input shaft bearing (B)



18.6 Left-hand balancer shaft bearing is retained by screw and washer (arrowed)


19.2a Lift out the input shaft selector fork shaft


19.2b Note the location of the input shaft selector fork (arrowed)


19.3a Lift out the output shaft selector fork shaft – note the circlip (arrowed)

19 Selector drum and forks

Note: *To access the selector drum and forks, the engine must be removed from the frame.*

Removal

Type 122 engine

1 To access the selector drum and forks, follow the procedure in Section 16 and separate the crankcase halves.

2 Lift out the input shaft selector fork shaft **(see illustration)**. Note how the input shaft selector fork locates in the groove on the 3rd/4th gear pinion and how the guide pin on the fork locates in the groove in the selector drum **(see illustration)**.

Note: *All three selector forks are different but they may not be marked – to aid identification, mark each fork with a dab of paint before removing them.*

3 Lift out the output shaft selector fork shaft, noting the location of the circlip on the shaft **(see illustration)**. Note how the output shaft selector forks locate in the grooves on the 5th (lower) and 6th (upper) gear pinions and how the guide pins on the forks locate in the grooves in the selector drum **(see illustration)**.

4 Note the position of the selector drum as an aid for installation, then undo the drum centre bolt and remove the bolt and washer **(see illustration)**. Displace the selector fork guide pins from the grooves in the drum and lift the drum out **(see illustrations)**.

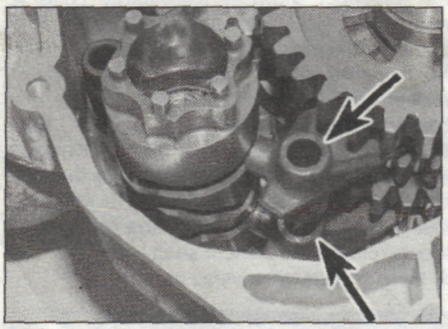
5 Displace the output shaft selector forks from the grooves in the gear pinions and lift them out **(see illustrations)**. Slide the forks back onto their shaft the right way round. **Note:** *On some engines, the lower fork is marked 123 and the upper fork is marked 113.*

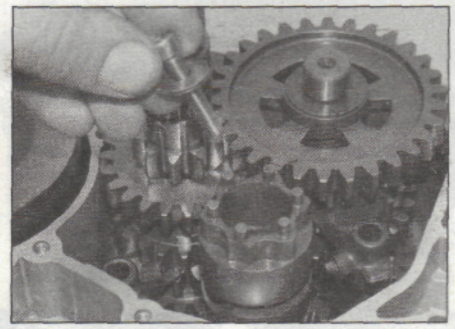
6 The input shaft selector fork can only be removed from the crankcase with the transmission shafts assembly. Withdraw the transmission gearshafts (see Section 20), then lift the fork out of the groove in the 3rd/4th gear pinion **(see illustration)**.

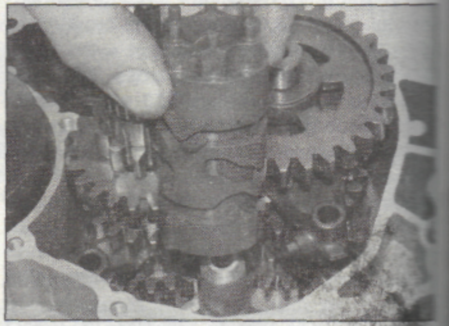
Type 123 engine

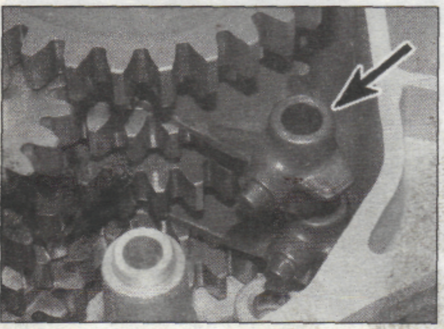
7 To access the selector drum and forks, follow the procedure in Section 16 and separate the crankcase halves.

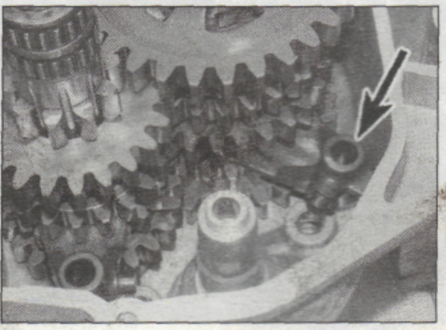
8 Note how the output shaft selector forks locate in the grooves on the 5th (lower) and 6th (upper) gear pinions and how the input shaft selector fork locates in the groove in the

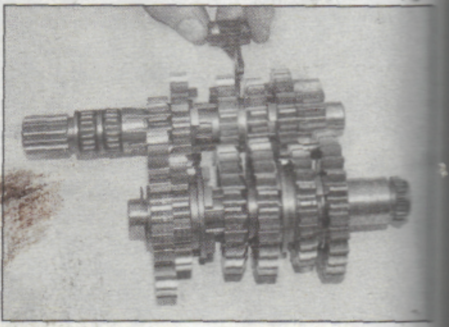

19.3b Note the location of the output shaft selector forks (arrowed)

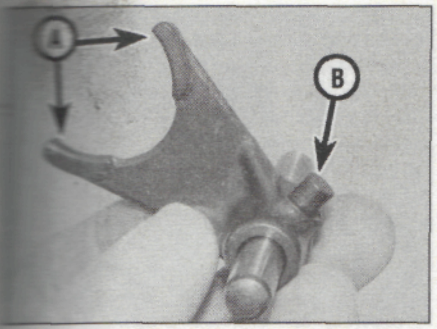

19.4a Remove the selector drum centre bolt and washer . . .


19.4b . . . and lift the drum out


19.5a Manoeuvre out the upper . . .


19.5b . . . and lower output shaft selector forks


19.6 Lift off the input shaft selector fork



19.11 Check the ends of the selector forks (A) and the guide pins (B) for wear

3rd/4th gear pinion. Note how the guide pins on the forks locate in the grooves in the selector drum **(see illustration 15.13). Note:** *All three selector forks are different but they may not be marked – to aid identification, mark each fork with a dab of paint before removing them.*

9 Lift out the selector fork shaft, then displace the selector forks and lift them out. Slide the forks back onto the shaft in the correct order and the right way round.

10 Note the position of the selector drum as an aid for installation, then lift the gearchange shaft and selector drum out of the crankcases as an assembly. Separate the selector drum from the shaft, noting how the selector pawl engages with the pins on the drum.

Inspection – all engines

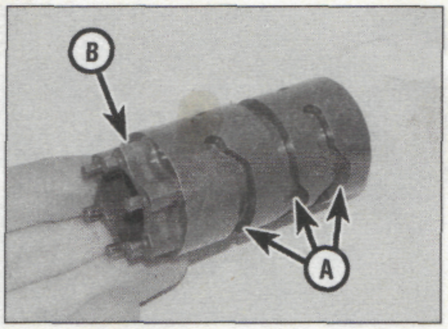
11 Inspect the selector forks for any signs of wear or damage, especially around the fork ends where they engage with the grooves in the gear pinions **(see illustration)**. Check that each fork fits correctly in its pinion groove. *Check closely to see if the forks are bent.* If the forks are in any way damaged they must be replaced with new ones.

12 Check that the forks fit correctly on their shafts – they should move freely with a light fit but no appreciable freeplay. Check that the fork shaft holes in the casing are not worn or damaged.

13 Check that the selector fork shafts are straight by rolling them on a flat surface such as a sheet of glass. A bent shaft will cause difficulty in selecting gears and make the gearchange action heavy and should be replaced with a new one. **Note:** *If the circlip is removed from the output shaft selector fork shaft (Type 122 engines) replace it with a new one.*

14 Inspect the selector drum grooves and selector fork guide pins for signs of wear or damage **(see illustration)**. If either show signs of wear or damage they must be replaced with new ones.

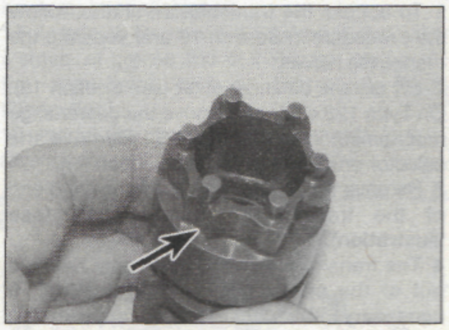
15 On Type 122 engines, the selector drum turns on two bearings **(see illustration)**. Check the condition of the bearings – they should spin freely and smoothly without any rough spots or excessive noise – and only remove them if they are unserviceable. Tap the outer bearing out with a drift inserted through from the other end of the drum, then remove the circlip securing the inner bearing and drive that bearing out also. If required, heat the drum with a hot air gun to aid bearing removal. Install the new bearings in the reverse order of removal – don't forget to secure the inner bearing with a new circlip



19.14 Inspect the grooves (A) in the selector drum. Note the stopper arm detents (B)

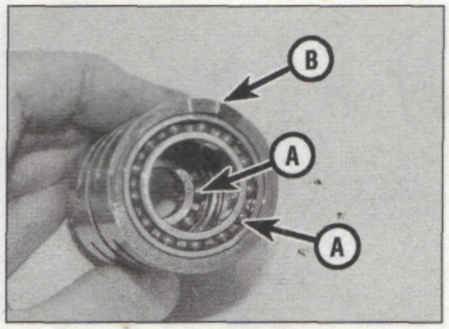
16 Check the detents in the end of the selector drum, where the stopper arm roller locates, for wear **(see illustration 19.14)**. Check the pins in the end of the drum, where the selector arm pawls locate, for wear **(see illustration)**.

17 Check the neutral switch contact **(see illustration 19.15)**. Renew the selector drum if any part is worn or damaged.



19.16 Inspect the pins on the end of the selector drum. Note the neutral detent (arrowed)

19.18b Unscrew the switch from the outside of the casing



19.15 Check the two bearings (A) in the selector drum – Type 122 engines. Note the neutral switch contact (B)

18 Check the contact of the neutral switch in the crankcase **(see illustration)**. If necessary, unscrew the switch and fit a new one with a new sealing washer **(see illustration)**.

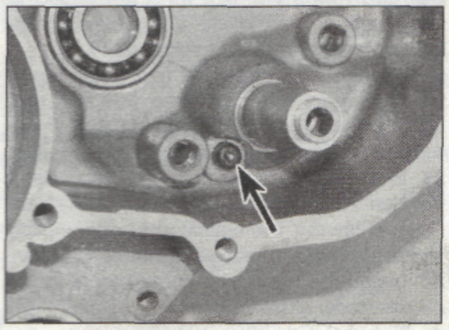
Installation

Type 122 engine

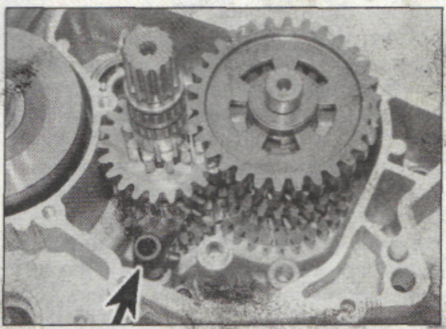
19 Assemble the transmission shafts and locate the input shaft selector fork in the groove in the 3rd/4th gear pinion **(see illustration 19.6)**. Make sure the selector fork is fitted the right way round.

20 Install the transmission shafts in the right-hand crankcase half, ensuring the input shaft selector fork remains in place **(see illustration)**.

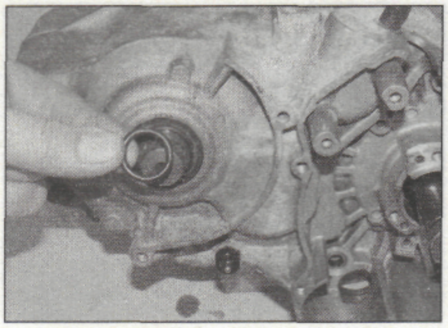
21 Install the output shaft lower selector fork



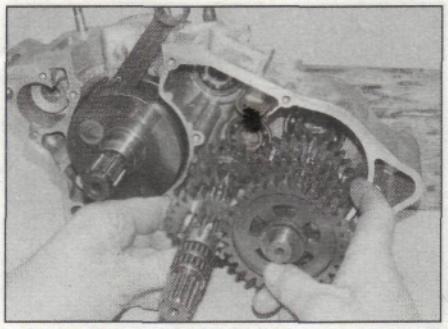
19.18a Location of the neutral switch contact in the crankcase



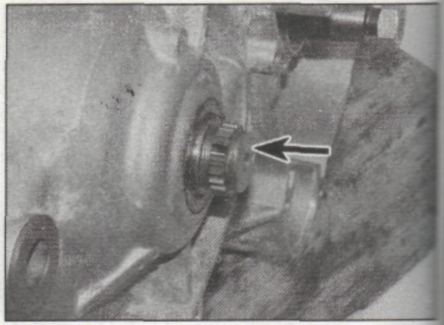
19.20 Location of the transmission shafts in the right-hand crankcase – note the location of the input shaft selector fork (arrowed)



20.3 Remove the O-ring from the transmission output shaft



20.4a Lift the transmission shafts out as an assembly



20.4b Tap the end of the output shaft to aid removal

in the groove in the 5th gear pinion and install the output shaft upper selector fork in the groove in the 6th gear pinion **(see illustrations 19.5b and 5a)**. Make sure the selector forks are fitted the right way round (see Step 2).

22 Lubricate the selector drum bearings with clean transmission oil, then install the selector drum, aligning the neutral switch contact with the switch contact in the crankcase. Install the drum centre bolt and washer and tighten the bolt to the torque setting specified at the beginning of this Chapter.

23 Engage the output shaft selector fork guide pins in their grooves in the drum – the lower selector fork guide pin locates in the lower groove and the upper selector fork guide pin locates in the upper groove **(see illustration 19.3b)**. Secure the selector forks with the fork shaft, ensuring the circlip is uppermost. Press the shaft all the way into its hole in the casing **(see illustration 19.3a)**.

24 Engage the input shaft fork guide pin in the middle groove in the drum and secure it with its shaft **(see illustration 19.2b)**. Press the shaft all the way into its hole in the casing.

25 Ensure the selector drum is in the neutral position and check the alignment of the gear pinions on the transmission shafts – both shafts should be free to rotate independently.

26 Install the remaining components in the reverse order of disassembly.

Type 123 engine

27 Lubricate both ends of the selector drum with clean transmission oil, then install the selector drum, aligning the neutral switch contact with the switch contact in the crankcase. Locate the stopper arm roller in the neutral detent on the selector drum.

28 Install the gearchange shaft (see Section 15).

29 Install the selector forks – the lower fork locates in the groove in the output shaft 5th gear pinion and the fork guide pin locates in the lower groove in the selector drum; the middle fork locates in the groove in the input shaft 3rd/4th gear pinion and the fork guide pin locates in the middle groove in the selector drum; the upper fork locates in the groove in the output shaft 6th gear pinion and the fork guide pin locates in the upper groove in the selector drum. If the forks are installed correctly, the holes for the fork shaft will align – install the shaft and press it all the way into its hole in the casing.

30 Ensure the selector drum is in the neutral position and check the alignment of the gear pinions on the transmission shafts – both shafts should be free to rotate independently.

31 Install the remaining components in the reverse order of disassembly.

20 Transmission gearshafts removal and installation

Note: *To access the transmission shafts, the engine must be removed from the frame.*

Removal

1 To access the transmission shafts, follow the procedure in Section 16 and separate the crankcase halves.

2 Lift out the balancer shaft (see Section 18). On Type 123 engines, remove the gearchange mechanism (see Section 15). Remove the selector drum and forks (see Section 19).

3 Remove the O-ring from the right-hand end of the transmission output shaft **(see illustration)**.

4 The transmission shafts can now be lifted out of the crankcase **(see illustration)**. If necessary, have an assistant support the right-hand crankcase half and tap the right-hand end of the output shaft with a soft-faced mallet to aid disassembly **(see illustration)**. On Type 122 engines, remove the input shaft selector fork from the groove on the 3rd/4th gear pinion **(see illustration 19.6)**.

5 Note any thrust washers or shims fitted to the ends of the transmission shafts and either remove them for safekeeping or, if the shafts are not going to be disassembled, secure them in place on the shaft with a dab of grease. **Note:** *On the RS125 shown, shims were fitted to the transmission output shaft only.*

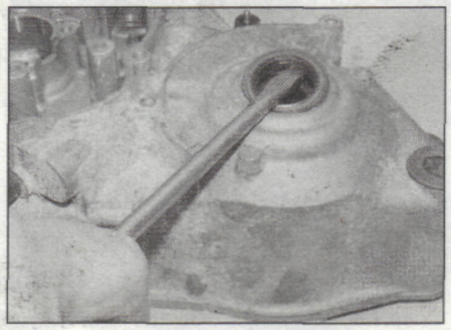
6 Lever out the output shaft seal in the right-hand crankcase half with a flat-bladed screwdriver, noting which way round it is fitted. Discard the seal as a new one must be fitted **(see illustration)**.

7 The transmission shafts turn on caged ball bearings – the bearings should spin freely and smoothly without any rough spots or excessive noise **(see illustration)**. If required, flush the bearings with a suitable solvent then dry them thoroughly – use low pressure compressed air if it is available. Oil the bearings lightly with clean transmission oil, then check them as described.

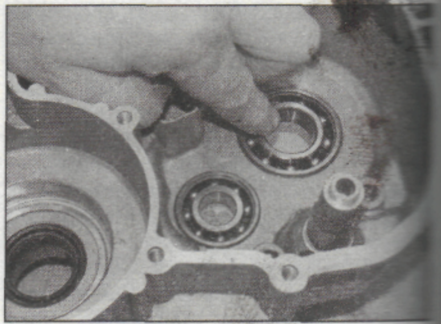
8 Only remove the bearings from the crankcases if they are unserviceable and need to be renewed.

9 On some Type 123 engines, the transmission bearings in the left-hand crankcase half are secured by a retaining plate. Undo the screws securing the plate and lift it off – note the location of any shims between the plate and the bearings and remove them for safekeeping.

10 Before removing a bearing, check to see



20.6 Lever out the transmission output shaft oil seal



20.7 Check the condition of the bearings how it is fitted. Some bearings can be driven out with a suitably-sized socket or bearing driver placed against the inner bearing race **(see illustration)**. Support the crankcase half on wooden blocks so that it is stable and take care not to *damage the sealing surfaces of the* case. Heat the bearing housing with a hot air gun to aid removal and installation. Note which way round the bearing is fitted. Avoid undue force on installation which will damage the bearing; drive the new bearing in with a socket placed against the outer race and ensure it is driven all the way into its housing **(see illustration)**.

11 Some bearings, such as the right-hand input shaft bearing, *locate in a blind hole and* cannot be driven out **(see illustration 18.5)**. Use a slide-hammer with knife-edged bearing puller attachment to remove these bearings **(see illustrations 16.15b and 15c)**.

12 On Type 123 engines, if applicable, install the shims on the transmission bearings in the left-hand *crankcase, then fit the retaining* plate. Clean the screw threads and apply a suitable non-permanent thread-locking compound, then tighten the screws securely.

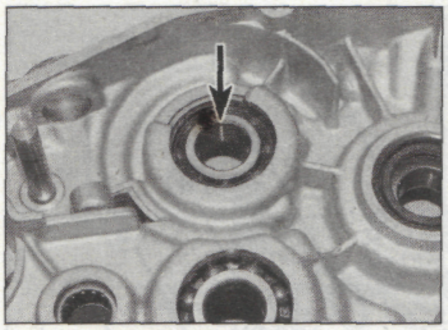
Installation

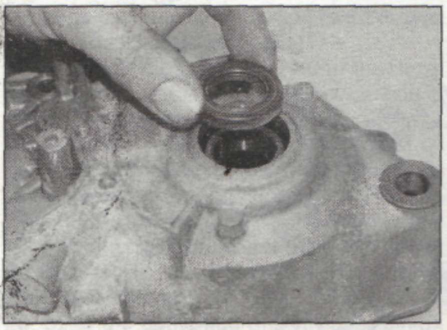
13 Lubricate the new output shaft seal with a smear of grease and press it into the casing **(see illustration)**.

14 Lubricate the *transmission shaft bearings* with the recommended transmission oil.

15 Ensure any thrust washers or shims noted on removal are in place on the transmission shafts. Place the shafts side-by-side on the work surface and align the gear pinions. On Type 122 engines, fit the input shaft selector fork into its groove in the 3rd/4th gear pinion, making sure that it is the right way round **(see illustration 19.6)**.

16 Grasp *the shaft assembly and lower it into* the crankcase **(see illustration 20.4a)**.

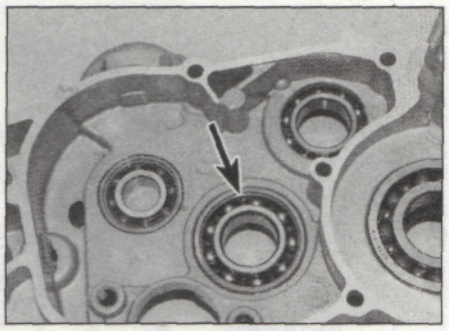

20.10a Some bearings can be driven out with a driver placed against the inner race (arrowed)

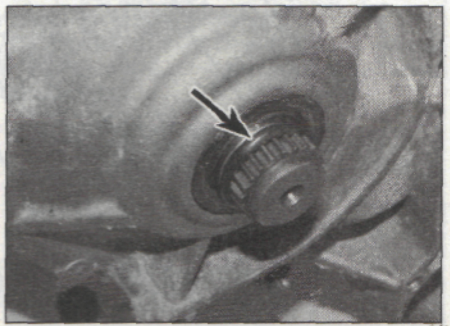

20.13 Press the new output shaft seal into place

17 Ensure the ends of both transmission shafts are fully located in their bearings and that any thrust washers or shims, if fitted, have not been displaced.

18 Lubricate the new output shaft O-ring with a smear of grease and fit it into the groove in the right-hand end of the shaft **(see illustration)**.

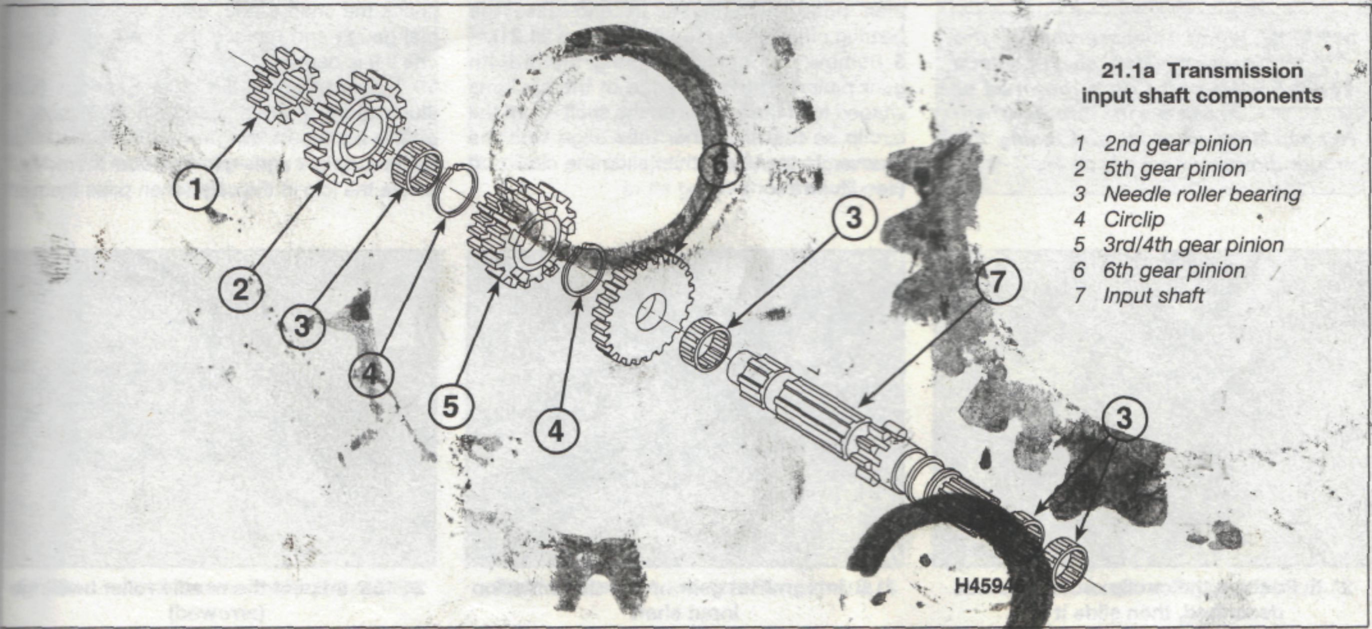
19 *Install the remaining components in the reverse order of removal*


20.10b Drive the new bearing in with a driver placed against the outer race (arrowed)


20.18 Fit a new O-ring (arrowed) on the right-hand end of the output shaft

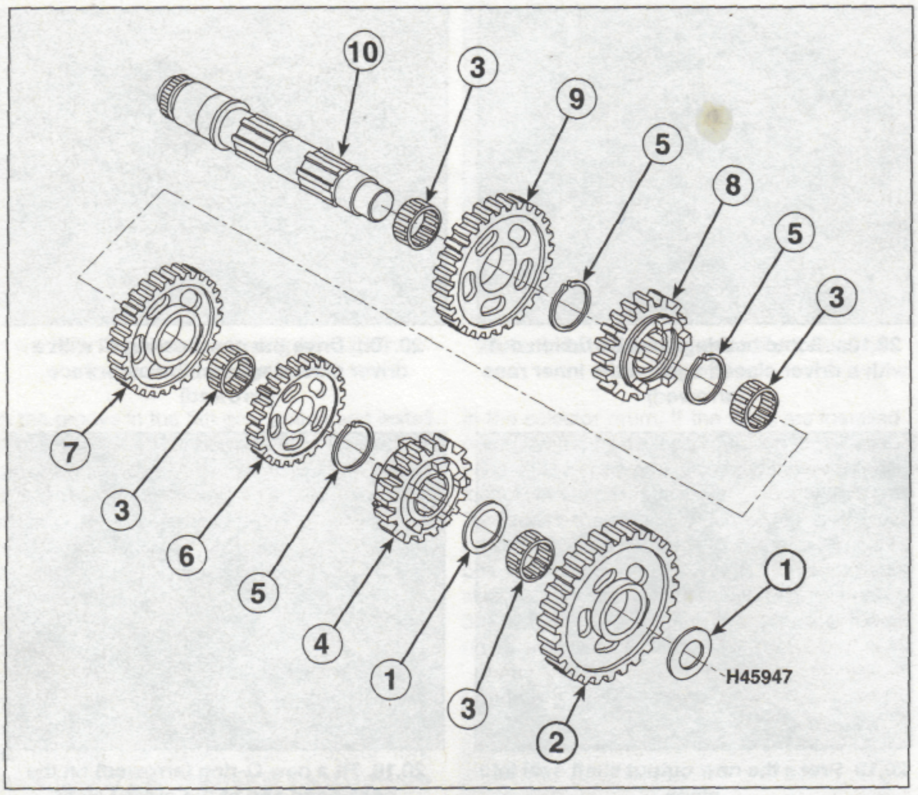
21 Transmission gearshafts overhaul

1 Remove the transmission shafts from the crankcase (see Section 20). Always disassemble the transmission shafts separately to avoid mixing up the components **(see illustrations)**.



21.1a Transmission input shaft components

1 *2nd gear pinion*
2 *5th gear pinion*
3 *Needle roller bearing*
4 *Circlip*
5 *3rd/4th gear pinion*
6 *6th gear pinion*
7 *Input shaft*



21.1b Transmission output shaft components

1 Thrust washer
2 1st gear pinion
3 Needle roller bearing
4 6th gear pinion
5 Tabbed circlip
6 4th gear pinion
7 3rd gear pinion
8 5th gear pinion
9 2nd gear pinion
10 Output shaft

Warning: The gear pinions are secured by circlips – fit new circlips on reassembly, never re-use the old circlips.

Input shaft disassembly

HAYNES HiNT ***When disassembling the transmission shafts, place the parts on a long rod or thread a wire through them to keep them in order and facing the proper direction.***

2 Remove the 2nd gear pinion from the right-hand end of the shaft **(see illustration 21.23)**.

3 Slide the 5th gear pinion off the shaft **(see illustration 21.22)**.

4 The 5th gear pinion needle roller bearing has a split cage – locate the join in the cage, then prise the ends apart and ease the bearing off carefully **(see illustration 21.21)**.

5 Remove the circlip securing the 3rd/4th gear pinion. The inner edge of the circlip is shaped to fit the splines on the shaft – turn the circlip so that the inner tabs align with the grooves in the shaft, then slide the circlip off **(see illustration)**.

6 Slide the combined 3rd/4th gear pinion off, noting which way round it fits **(see illustration 21.20a)**.

7 Prise out the circlip securing the 6th gear pinion and remove it, then slide the pinion off the shaft **(see illustrations 21.19c and 19a)**.

8 The 1st gear pinion is integral with the shaft **(see illustration)**. Unless they are worn or damaged, the remaining needle roller bearings can be left in place on the input shaft.

Input shaft inspection

9 Wash all the components in solvent and dry them off.

10 Check the gear teeth for cracking, chipping, pitting and other obvious wear or damage. Any pinion that is damaged must be renewed. **Note:** *If a pinion on the input shaft is damaged, check the corresponding pinion on the output shaft. Transmission pinions should be renewed in matched pairs.*

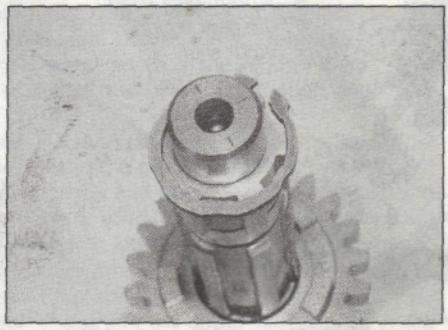
11 Inspect the dogs and the dog holes in the gears for cracks, chips, and excessive wear especially in the form of rounded edges. Make sure mating gears engage properly. Renew mating gears as a set if necessary.

12 Check for signs of scoring or blueing on the pinions and shaft. This could be caused by overheating due to inadequate lubrication. Replace any worn or damaged parts with new ones.

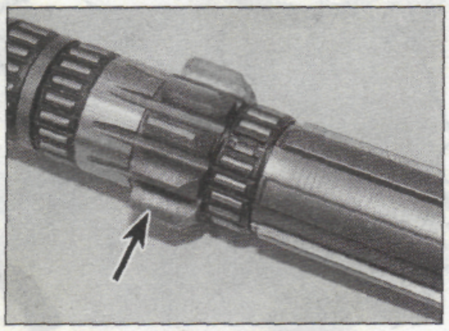
13 Check that each pinion moves freely on the shaft but without undue freeplay.

14 The shaft is unlikely to sustain damage unless the engine has seized, placing an unusually high loading on the transmission, or the machine has covered a very high mileage. Check the surface of the shaft, especially where a pinion turns on it, and replace the shaft with a new one if it has scored or picked up, or if there are any cracks. If available, check the shaft runout using V-blocks and a dial gauge and replace the shaft with a new one if it is bent.

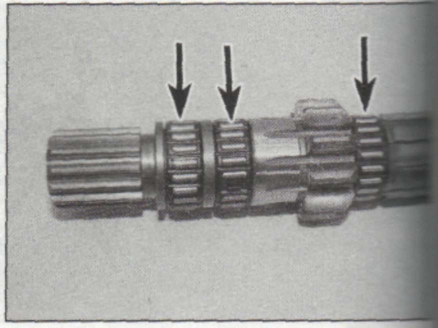
15 Inspect the needle roller bearings **(see illustration)**. There should be no flat spots or pitting on the bearing rollers. The bearings have a split cage – to remove them, first locate the join in the cage, then prise them off



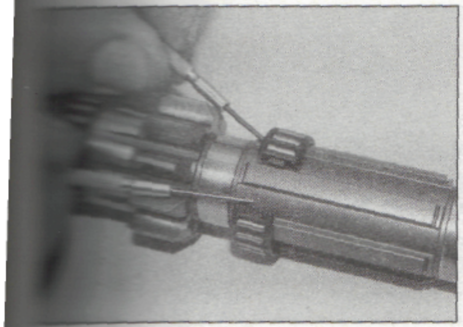
21.5 Position the circlip on the shaft as described, then slide it off



21.8 Integral 1st gear on the transmission input shaft



21.15a Inspect the needle roller bearings (arrowed)



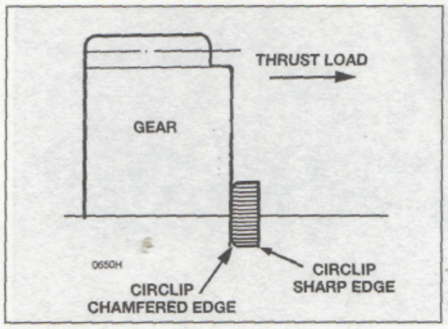
21.15b Prise the cage apart carefully to remove the bearing

the shaft carefully **(see illustration)**. If the needle rollers are damage, it is likely that the internal bearing surface of the corresponding gear pinion is worn also. **Note:** *The two bearings on the left-hand end of the input shaft support the clutch housing (see Section 13).*

16 Check the shaft bearings in the crankcase halves (see Section 20).

Input shaft reassembly

17 During reassembly, apply clean transmission oil to the mating surfaces of the shaft and pinions. When installing the new circlips, do not expand their ends any further than is necessary to slide them along the shaft. Install them so that their chamfered side faces the pinion they secure **(see illustration)**.

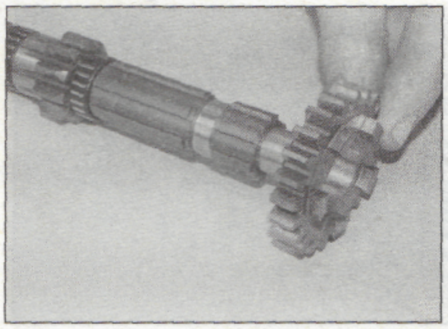


21.17 Correct fitting of a stamped circlip

18 If removed, install the needle roller bearings for the clutch housing and 6th gear pinion **(see illustration 21.15a)**

19 Slide the 6th gear pinion onto the right-hand end of the shaft with its dogs facing away from the integral 1st gear **(see illustration)**. Position the 6th gear pinion on its bearing and secure it with the new circlip **(see illustration)**. Follow the procedure in Step 5 to locate the circlip on the shaft, then slide it into position. Make sure the circlip locates correctly in the groove in the shaft **(see illustrations)**.

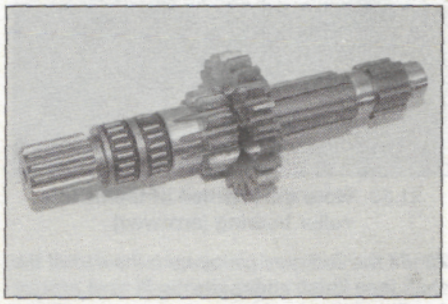
20 Slide the combined 3rd/4th gear pinion onto the shaft with the larger 4th gear pinion facing the 6th gear pinion **(see illustration)**. Fit the new circlip, making sure it locates correctly in its groove in the shaft **(see illustration)**.



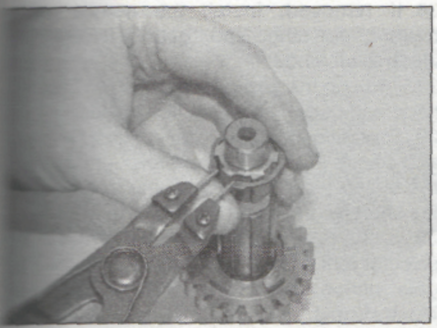
21.19a Slide on the 6th gear pinion from the right-hand end . . .

21 Install the needle roller bearing for the 5th gear pinion **(see illustration)**.

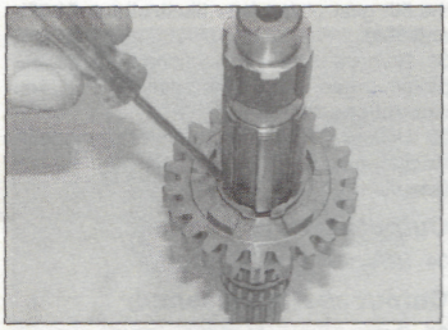
22 Fit the 5th gear pinion, making sure its dogs face the 3rd/4th gear pinion **(see illustration)**.



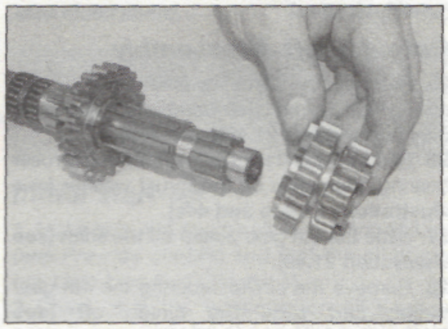
21.19b . . . and position it on its bearing



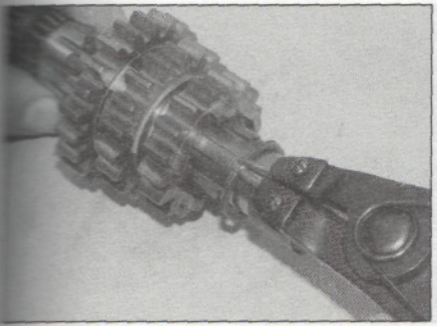
21.19c Fit a new circlip onto the end of the shaft . . .



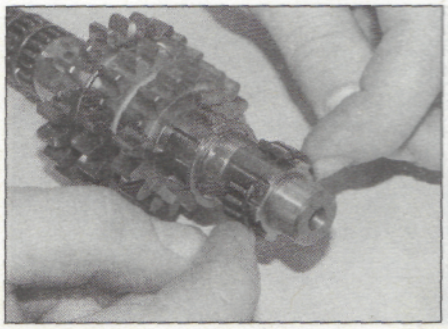
21.19d . . . then slide it down and locate it in its groove



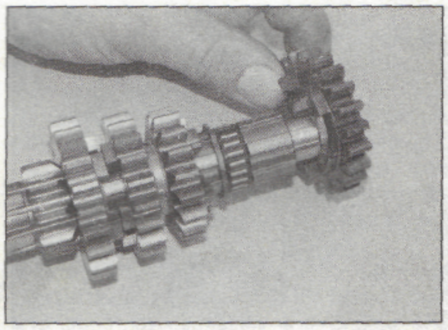
21.20a Slide on the 3rd/4th gear pinion . . .



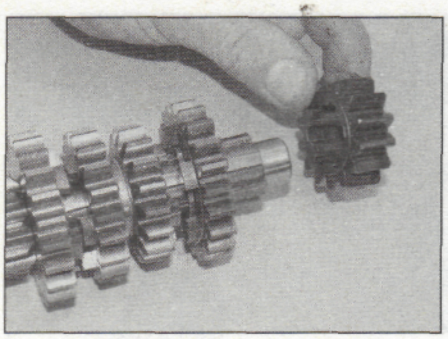
21.20b . . . and secure it with the circlip



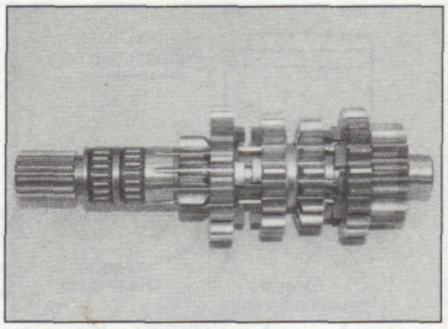
21.21 Install the needle roller bearing



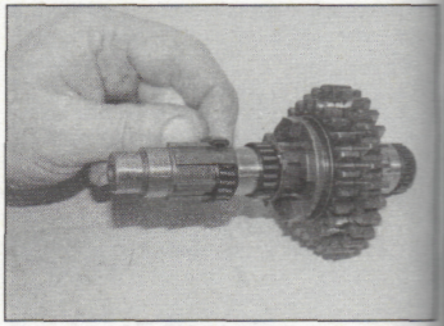
21.22 Slide on the 5th gear pinion



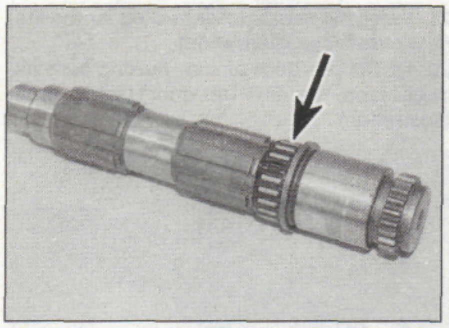
21.23 Install the 2nd gear pinion



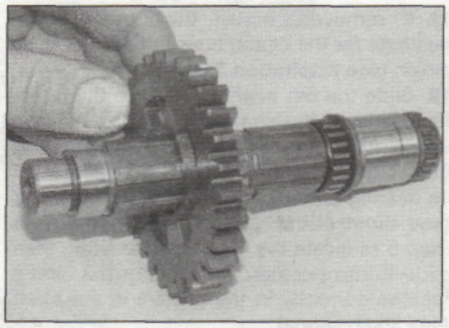
21.24 The assembled transmission input shaft



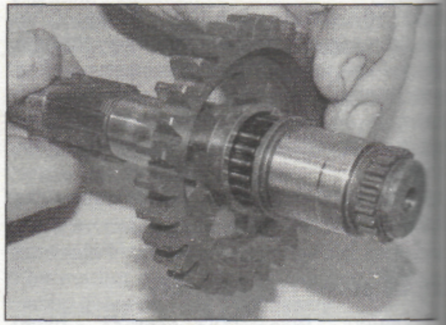
21.30 Remove the needle roller bearings carefully



21.33 Note the location of the needle roller bearing (arrowed)



21.37 Slide on the 2nd gear pinion from the left-hand end



21.38a Position the gear on its bearing . . .

23 Fit the 2nd gear pinion onto the end of the shaft **(see illustration)**.

24 Check that all components have been correctly installed **(see illustration 21.1a)**. The assembled shaft should look as shown **(see illustration)**.

Output shaft disassembly

25 Remove the thrust washer and the 1st gear pinion from the left-hand end of the shaft. **(see illustrations 21.45b and 45a)**.

26 Slide off the 1st gear pinion needle roller bearing, then slide off the thrust washer **(see illustrations 21.44b and 44a)**.

27 Slide the 6th gear pinion off the shaft **(see illustration 21.43)**.

28 Remove the circlip securing the 4th gear pinion and slide the pinion off **(see illustrations 21.42 and 41b)**.

29 Remove the 3rd gear pinion **(see illustrations 21.41a)**.

30 The 3rd and 4th gear pinion needle roller bearings have a split cage – locate the join in the cage, then prise the ends apart and ease the bearings off carefully **(see illustration)**.

31 Slide the circlip off the shaft, then slide off the 5th gear pinion **(see illustrations 21.39b and 39a)**.

32 Remove the circlip securing the 2nd gear pinion, then slide the pinion off **(see illustrations 21.38b and 37)**.

33 *Unless it is worn or damaged, the needle roller bearing can be left in place on the shaft* **(see illustration)**.

Output shaft inspection

34 Refer to Steps 9 to 16 above.

Output shaft reassembly

35 During reassembly, apply clean transmission oil to the mating surfaces of the shaft and pinions. When installing the new circlips, do not expand their ends any further than is necessary to slide them along the shaft. Install them so that their chamfered side faces the pinion they secure **(see illustration 21.17)**.

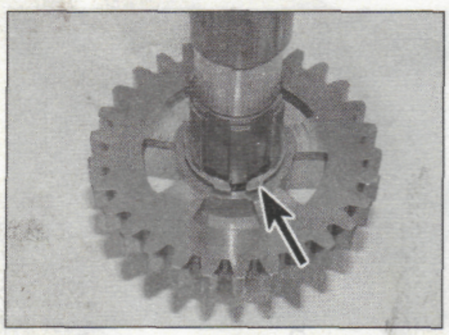
36 If removed, install the needle roller bearing for the 2nd gear pinion **(see illustration 21.33)**

37 Slide on the 2nd gear pinion onto the left-hand end of the shaft **(see illustration)**.

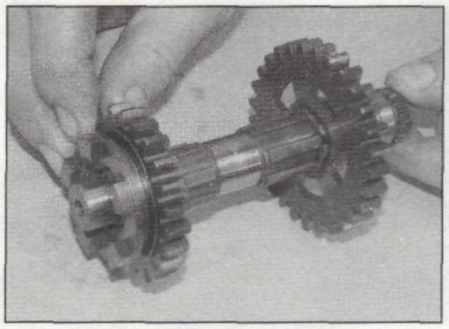
38 *Position the 2nd gear pinion on its bearing* and secure it with the new circlip – make sure the circlip locates correctly in the groove in the shaft **(see illustrations)**.

39 Slide on the 5th gear pinion with its selector fork groove facing away from the 2nd gear pinion, then fit the new circlip **(see illustrations)**.

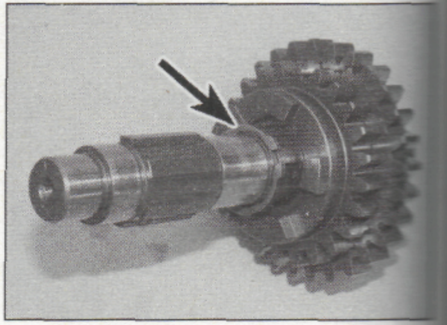
40 Install the needle roller bearings for the 3rd and 4th gear pinions **(see illustration 21.30)**.



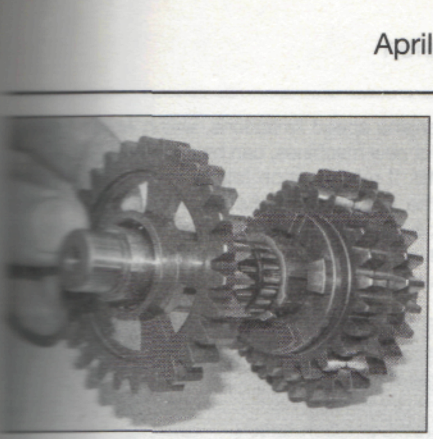
21.38b . . . and secure it with the circlip (arrowed)

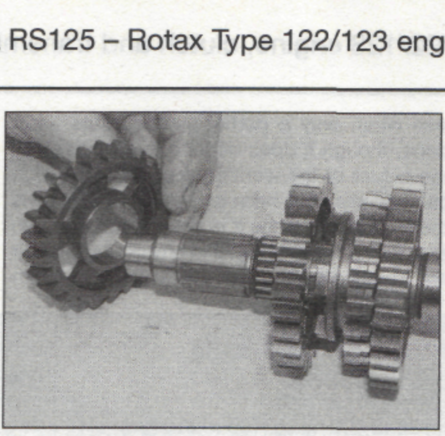


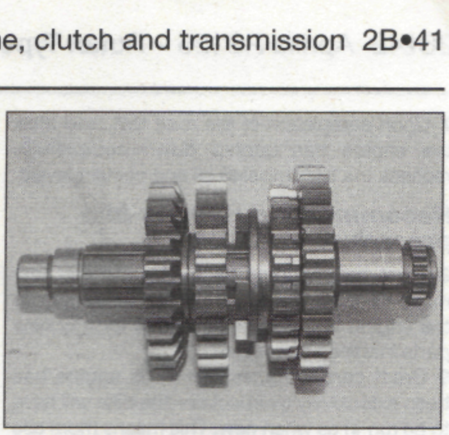
21.39a Slide on the 5th gear pinion . . .

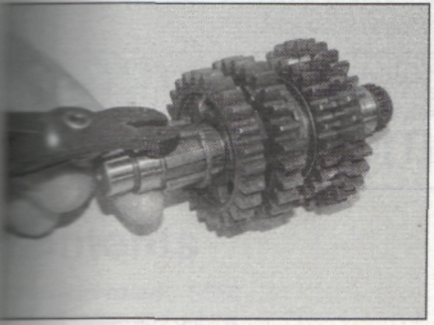


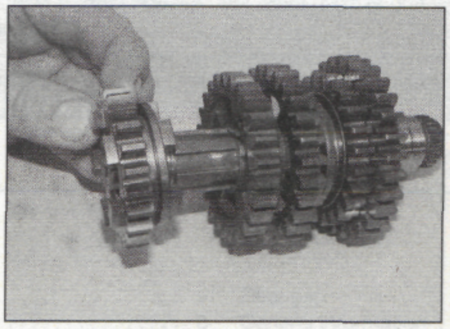
21.39b . . . and secure it with the circlip (arrowed)

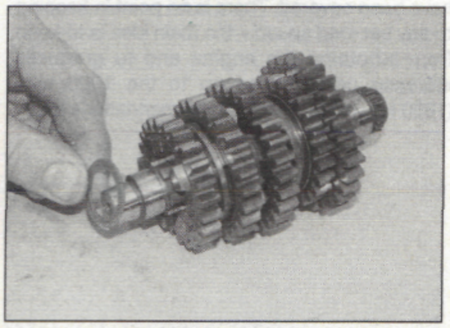

21.41a Slide on the 3rd gear pinion . . .


21.41b . . . and the 4th gear pinion . . .


21.41c . . . and position them on their bearings


21.42 Secure the pinions with the circlip


21.43 Slide on the 6th gear pinion


21.44a Fit the thrust washer . . .

41 Slide on the 3rd gear pinion and the 4th gear pinion and position the pinions on their bearings **(see illustrations)**.

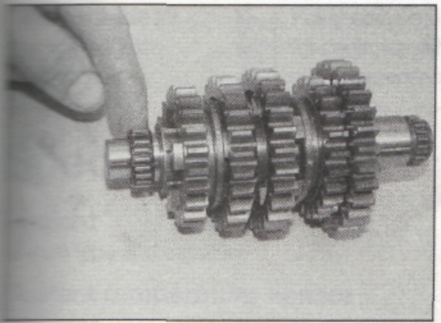
42 Fit the new circlip **(see illustration)**.

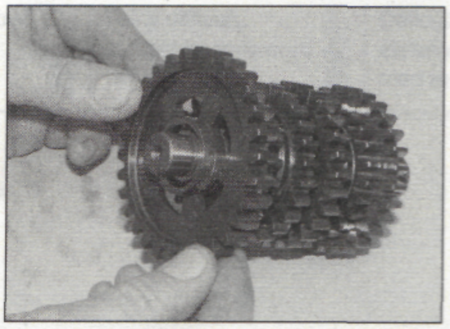
43 Slide on the 6th gear pinion with its selector fork groove facing the 4th gear pinion **(see illustration)**.

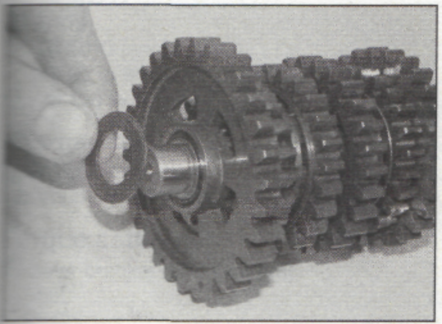
44 Fit the thrust washer and the 1st gear pinion needle roller bearing **(see illustrations)**.

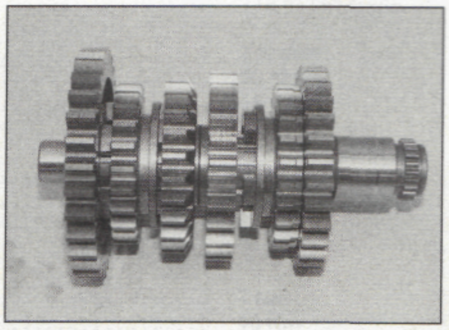
45 Fit the 1st gear pinion and the thrust washer **(see illustrations)**.

46 Check that all components have been correctly installed **(see illustration 21.1b)**. The assembled shaft should look as shown **(see illustration)**.


21.44b . . . and the needle roller bearing


21.45a Fit the 1st gear pinion . . .


21.45b . . . and the thrust washer


21.46 The assembled transmission output shaft

22 Initial start-up after overhaul/running-in

Initial start-up

1 Make sure the engine oil tank is topped up (see *Pre-ride checks*) and that the oil pump has been bled (see Chapter 1).

2 Check that the transmission oil level is correct (see Chapter 1) and that the coolant level is correct (see *Pre-ride checks*).

3 Make sure there is fuel in the tank, then turn the fuel tap to the 'ON' position, and set the choke.

4 Turn the ignition 'ON' and check that the transmission is in neutral (see Chapter 9).

5 Start the engine, then allow it to run at a moderately fast idle until it reaches normal operating temperature. Do not be alarmed if there is a little smoke from the exhaust – this will be due to the oil used to lubricate the piston and bore during assembly and should subside after a while.

6 Check carefully that there are no oil or coolant leaks and make sure the transmission and controls, especially the brakes and clutch, work properly before road testing the machine.